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#### 论文

新质源CMS-FA杂交稻系统的亲本资源筛选

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摘要:

用新质源雄性不育系金农1A(CMS-FA)作母本,分别与来自10个国家和国内13个省份的220个水稻品种组配成杂交种,考察F<sub>1</sub>代的花粉染色率、套袋结实率和自然结实率。在F<sub>1</sub>代中,当这3项育性指标均≤10%时,显示父本品种具有雄性不育保持能力,因而将其划分为保持系资源;当3项育性指标均≥80%时,显示父本品种具有雄性不育恢复能力,将其划分为恢复系资源;此外的其他父本品种,即3项育性指标中任何一项指标>10%或<80%,既不能作为保持系,也不能作为恢复系,被划分为非杂交稻亲本资源。在220个水稻品种中,可作为金农1A保持系的有122个,占55.5%;未发现恢复系亲本;非杂交稻亲本资源。在220个水稻品种中,可作为金农1A保持系的有122个,占55.5%。对照野败型不育系珍汕97A(CMS-WA)的保持系亲本品种有44个,占20.0%;恢复系亲本品种42个,占19.1%;非杂交稻亲本品种134个,占60.9%。CMS-WA型的杂交稻亲本资源利用率为39.1%。CMS-FA系统比CMS-WA系统的亲本稻种资源利用率高16.4个百分点,尤其是保持系资源利用率高35.5个百分点(近1.8倍)。国外品种的育性普遍低于国内品种。

关键词: CMS-FA 保持系 杂交稻亲本资源利用率 花粉染色率 套袋结实率 自然结实率

Screening Parent Resources of Hybrid Rice in New Cytoplasm Male Ste- rile System (CMS-FA)

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#### Abstract:

Jinnong 1A is a new type of cytoplasm male sterile (CMS) line in three-line hybrid rice (*Oryza sativa* L.). It is completely different from the sterile line of CMS-WA and CMS-HL types, and designated as CMS-FA type. In this study, Jinnong 1A, as the female parent, was crossed with 220 rice varieties originated from 10 countries and 13 provinces of China. The fertility of the  $\rm F_1$  generation was evaluated with  $\rm F_1$  pollen dye ability rate, bagged seed-setting rate, and natural seed-setting rate. The male parent was classified into maintainer or restorer lines when all the three fertility indices were  $\leq 10\%$  or  $\geq 80\%$  in the  $\rm F_1$  generation. Otherwise, it was regarded as non-parental variety for CMS-FA hybrid rice. In the total 220 varieties, 122 were identified as maintainer lines of Jinnong 1A, which accounted for 55.5%, but no varieties could be used as restorer lines. The other 98 varieties (accounting for 45.5%) were non-parent for CMS-FA hybrid rice. With regard to CMS-WA sterile line, Zhenshan 97A taken as the control in the study, the maintainer and restorer lines were 44 (20.0%) and 42 (19.1%), respectively. Compared with CMS-WA hybrid system, the CMS-FA system had a higher parent utilization rate by 16.4 percentile, especially the maintainer line utilization was higher by 35.5 percentile (up to 1.8 folds). Generally, the fertility abilities of domestic varieties were higher that those of in-troduced varieties in the  $\rm F_1$  generation.

Keywords: CMS-FA Maintainer line Utilization rate of parental resources of hybrid rice Pollen dyeability percentage Bagged seed-setting percentage Self-setting percentage

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